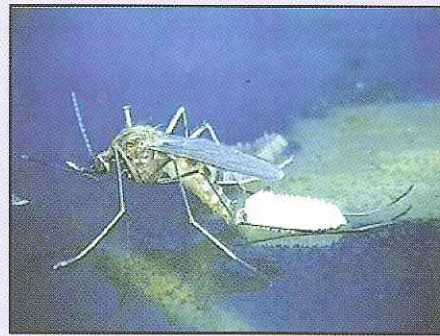


Preventing Disease Spread By Mosquitoes



Culex mosquito laying a raft of eggs

**Massachusetts Department of Public Health
Division of Epidemiology and Immunization**

June 2007

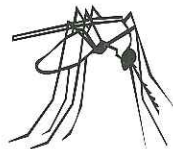
What diseases can mosquitoes spread?

In Massachusetts, some mosquitoes can transmit **eastern equine encephalitis (EEE) virus** and **West Nile virus (WNV)**.

Eastern equine encephalitis (EEE) is a rare but serious viral disease. Typical symptoms include high fever, stiff neck, headache, and lack of energy. Inflammation and swelling of the brain, called encephalitis, is the most dangerous and frequent serious complication. Most cases in Massachusetts occur in the southeastern part of the state.

West Nile virus (WNV) was first identified in the United States in 1999. Most WNV infections do not cause any symptoms. Mild WNV infections can cause fever, headache and body aches, often with a skin rash and swollen lymph glands. In a small percentage of people infected by the virus, the disease can be serious, even fatal. More severe infections can cause headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, paralysis, and, sometimes, death. Persons older than 50 years of age have a higher risk of developing severe illness.

The best way to prevent both of these illnesses is by avoiding mosquito bites. Only a small proportion of mosquitoes are infected at any given time. Thus, being bitten by a mosquito does not mean a person will become sick.



What is the best way to avoid mosquito bites?

The following personal protection measures are effective in reducing contact with mosquitoes:

- Scheduling outdoor activity to avoid the hours between dusk and dawn when mosquitoes are most active.
- Using mosquito repellents, making sure to follow directions on the label.
- Using mosquito netting on baby carriages or playpens when your baby is outdoors.
- Wearing long-sleeved shirts and long pants. This may be difficult to do when the weather is hot, but it will help keep mosquitoes away from your skin.
- Making sure screens are repaired and are tightly attached to doors and windows.
- Removing standing water from ditches, gutters, old tires, wheel barrows, and wading pools. Mosquitoes that bite people can begin to grow in any puddle or standing water that lasts for more than four days, so avoid letting water collect around your home.
- Avoiding camping overnight near freshwater swamps to reduce your risk of exposure to mosquitoes that carry the EEE virus. If you do go camping, use a tent with mosquito netting and use appropriate repellents.



What kind of mosquito repellent should I use?

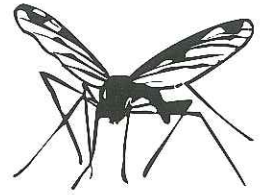
Different repellents work against different bugs.

It is important to look at the active ingredient on the product label. Repellents that contain **DEET**

(N, N-diethyl-m-toluamide), **permethrin**, or **picaridin** (KBR 3023) provide protection against

mosquitoes. In addition, **oil of lemon eucalyptus**

[p-methane 3, 8-diol (PMD)] has been found to provide as much protection as low concentrations of DEET when tested against mosquitoes found in the United States.



DEET products should not be used on infants under 2 months of age.

Children older than two months should use products with DEET concentrations of 30% or less. DEET products are available in formulations up to 100% DEET, so always read the product label to determine the percentage of DEET included. In general, the higher the percentage of DEET, the longer the duration of activity. Products with DEET concentrations higher than 30% do not confer much additional protection, but do last longer. In a study that looked at how long different concentrations of DEET worked against mosquitoes, the results ranged from 1½ hours using 4.75 % DEET to 5 hours using 23.8% DEET. However, the length of protection time will vary widely depending on temperature, perspiration, and water exposure.

Permethrin products are intended for use on items such as clothing, shoes, bed nets and camping gear and should not be applied to skin.

Apply the permethrin to your clothes before you put them on and follow the product's instructions.

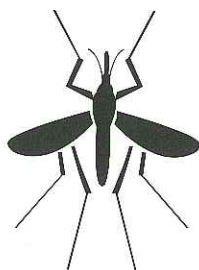
Oil of lemon eucalyptus products should **not** be used on children under the age of three years.

Do “natural” repellents work?

A number of plant-derived products are available for use as mosquito repellents, including oil of lemon eucalyptus. Limited information is available regarding how well most of these products work and how safe they are. The information that is available shows that most of these products generally do not provide the same level or duration of protection as products like DEET or permethrin, except for oil of lemon eucalyptus, which has been found to provide as much protection as low concentrations of DEET.

Use these products wisely!

- Follow the instructions on the product label. If you have questions after reading the label, contact the manufacturer.
- Don't use repellents under clothing.
- Don't use repellents on cuts or irritated skin.
- Don't use repellents near the mouth or eyes and use them sparingly around the ears. When using spray products, spray the product onto your hands first, and then apply it to your face.
- Use just enough product to lightly cover exposed skin and/or clothing. Putting on a larger amount does not make the product work any better.



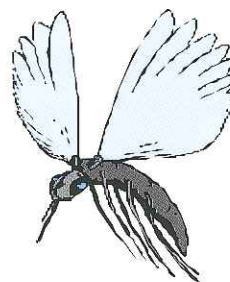
(Continued on next page)

Use these products wisely (continued)

- Don't let children handle the product. When using repellents on children, put some on your hands first, and then apply it to the child. Don't put repellents on a child's hands.
- When you come inside, wash your skin and the clothes that had repellent on them.

What should I do if I have a reaction to a repellent?

If you suspect that you or your child is having an adverse reaction to a repellent (for example, if you develop a rash or other symptoms you think were caused by using a repellent), remove any treated clothing, wash the affected area with soap and water, and contact your doctor or local poison control center. If you go to the doctor, take the repellent with you; the label information may be useful to your physician. The toll-free telephone number for the Regional Center for Poison Control and Prevention (serving Massachusetts and Rhode Island) is (800) 222-1222.



Where can I get more information?

For further information on EEE and WNV:

Massachusetts Department of Public Health (MDPH)
Division of Epidemiology and Immunization
(617) 983-6800 or toll-free at (888) 658-2850
www.mass.gov/dph/wnv/wnv1.htm

For further information on repellents:

Massachusetts Department of Public Health
Bureau of Environmental Health
(617) 624-5757

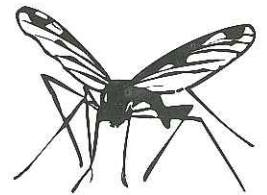
Massachusetts Department of Public Health Website
Fact Sheet on Mosquito Repellents
<http://mass.gov/dph/cdc/factsheets/factsheets.htm>

National Pesticide Information Center
1-800-858-7378
<http://npic.orst.edu/wnv/pesticideinfo.htm#repellents>

For information on mosquito control in your city or town:

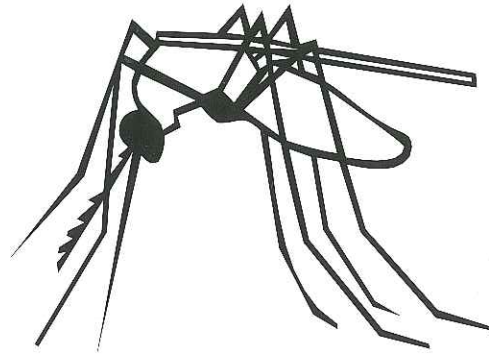
Massachusetts Department of Agricultural Resources
State Reclamation and Mosquito Control Board
(617) 626-1777
www.mass.gov/agr/mosquito/index.htm

Or call your local Board of Health.



**Massachusetts Department of Public Health
Bureau of Communicable Disease Control
Division of Epidemiology and Immunization**

**305 South Street
Jamaica Plain, MA 02130
Phone: 617-983-6800**



Cover photo: Centers for Disease Control and Prevention (CDC)

**This brochure was developed with funding support from
the Centers for Disease Control and Prevention (CDC).**